



Brian Vinchesi, the 2009 EPA WaterSense Irrigation Partner of the Year, is president of Irrigation Consulting Inc., a golf course irrigation design and consulting firm headquartered in Pepperell, Mass., that designs irrigation systems throughout the world. He can be reached at bvinchesi@irrigationconsulting.com or 978/433-8972.

IRRIGATING CONTROL SYSTEMS... MORE DECISIONS

There is no doubt that a decoder/two wire system needs to be grounded well. Not that a field controller system doesn't, but the decoder/two-wire systems are more sensitive due to the fact that electronic equipment is installed underground, where high voltages can be induced on the circuit by lightning. If the grounding is not adequate, then the system will be very susceptible to damage. A field controller system is also susceptible to damage, but the overall amount of damage would usually be less in a field controller system versus a decoder/two-wire system. Additionally, the odds of losing several holes or more at once are low in a conventional field controller system since the circuits are isolated in groups of sprinklers per controller.

In a decoder/two wire system, everything is basically connected as one circuit, so a lightning strike can be devastating if the system is not properly grounded and protected. Therefore, a great deal of attention should be paid to grounding. A high percentage of the wire savings from a conventional system should be used to increase the lightning protection. Lightning protection should consist of multiple pieces of equipment – not just grounding rods. These include:

Grounding Electrodes. Lightning occurs at a variety of frequencies, from zero to 100 megahertz. Ground rods are only effective in dissipating the lightning energy into the ground for low frequency strikes. Ground plates are effective at the full range of lightning frequencies because of their large amount of skin in contact with the soil and their low inductance characteristics. The combination of ground rods and plates provide broad band ground

grids that dissipate the lightning energy at all lightning frequencies.

Surge Suppression Devices. These devices, also known as lightning arresters, are required by the manufacturer and are installed at strategic points along the wire path to limit the voltage to a level below the specifications of the irrigation systems electronic equipment. The arresters divert the excess energy to the grounding electrodes and the energy is dissipated in the ground in the form of heat.

Cable Fuse Devices. These handy devices are installed in the communication cabling, usually at tee junctions, to allow one or more legs

across and down into the soil. The shield wire is intended to “shield” the wires below it. The shield wire has a lower path of resistance than the insulated wires below it.

Since many of these lightning protection devices are copper-based, they are expensive. The manufacturers have recommendations as to what degree of protection should be employed on their decoder/two-wire control systems, but many times additional lightning protection and surge suppression devices are eliminated or left off the design for cost-cutting, or to look less expensive than the competition or a field controller system. Based

“In a decoder/two wire system, everything is basically connected as one circuit, so a lightning strike can be devastating if the system is not properly grounded and protected.”

to be shut off so that troubleshooting can be more easily accomplished. The fuse, when blown, identifies which leg of the cable has a problem. Think of these devices as similar to isolation valves in a hydraulic system.

Exothermic Welding Connectors. Instead of putting a clamp on a rod that requires maintenance – yes, it needs to be cleaned and re-tightened at least annually – an exothermic connection fuses the ground wire to the rod, giving a better and long-lasting connection. Ground rods with pre-welded lead wires are now available.

Shield Wires. A shield wire consists of a solid, bare copper conductor installed 6 to 12 inches above the cabling; or, in a field controller system, above the wire bundle and is there to absorb electrical impulses traveling

on experience, some designers specify and recommend additional or more elaborate protection than is required by the manufacturer, so there will be fewer issues if lightning strikes or other electrical problems occur.

I would argue that when properly designed and installed, the type of control system, in terms of longevity and reliability, is the same. You decide what control system is the best fit for you and for your golf course. This decision includes not only how you manage the irrigation system but also your budget for the cost of the installation itself and your maintenance personnel in terms of how much time they have to work on any irrigation control system problems. Do your homework, sort through the rhetoric and pick the system that best works for you. **GCI**